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A Vacuum Tube Tester for Routine Work Using Alternating Current

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medium that the yeast count twenty-four hours afterwards was ten per cent below the control count.

There is no evidence of toxicity when only the salt solutions of pure water are irradiated and then added to the sugar solution. The toxicity is very marked when the sucrose solution is irradiated. The toxicity appears in sucrose, dextrose, glycerine, and calcium gluconate.

If irradiated air is bubbled through the medium, the toxicity does not appear as it does when ozone is bubbled through. The ozone, however, is not responsible for the retarded growth, except as it assists in the decomposition of the medium, for even after the irradiated medium has been heated to boiling before inoculation, the toxicity remains. Yeast also shows a very greatly retarded growth even if not inoculated into the medium until after two weeks subsequent to the irradiation. Our work shows that the direct effect of ultra violet upon the cell is not the only factor detrimental to yeast growth.

A VACUUM TUBE TESTER FOR ROUTINE WORK, USING ALTERNATING CURRENT

P. S. HELMICK

Some form of vacuum tube tester is a necessity in every radio laboratory. The vacuum tube tester herewith described is the result of an effort to design a simple instrument suitable for routine work, and which could be left permanently connected to the lighting circuit thus being always ready for use.

Fig. 1 shows the connections of the tester. A small bell-dinging transformer is connected to a 110 volt source of alternating current, to give 6 volts filament current for the vacuum tube. In order that a certain discarded 5 milliamper meter could be used to measure the plate current of the tube, this meter was connected between the plate and one of the 6 volt terminals of the transformer. Finally a switch was installed to connect the grid with the plate, or to leave the grid on open circuit.

In order to test a tube, the tube is inserted in the socket, leaving the grid switch open, and the deflection of the meter is noted when the switch is opened and closed. A deflection of the meter shows that the grid of the tube is not touching the plate, and gives an indication of the electron emission of the tube.

Of course refinements could be added, such as a voltmeter and rheostat to regulate the filament potential, and a potentiometer

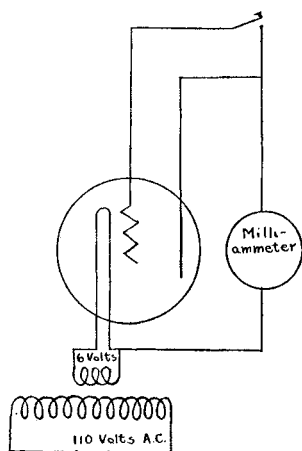


Fig 1.

arrangement attached to the 110 volt line to give any desired plate potential, but these accessories have been left out in the interest of simplicity, and because only approximate results were required.

As an example of the data given by this instrument, readings were made on 10 tubes type 210A, selected at random from the laboratory stock. The best tubes gave value of 1.2 m.a., while the poorer tubes which would give but mediocre results in a radio set gave values of 0.7 m.a.

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DO STUDENTS' GRADES IN PHYSICS CORRELATE WITH GRADES IN OTHER SUBJECTS?

ALICE NEFF

If we compare students' grades in physics with grades in other subjects, we find figures which are worth some notice as they reveal interesting facts.

Using the grades of 87 of Drake University College physics students, I find that their average grade in other subjects and their physics grades give a correlation of 90%. The means of both the physics and average grade are almost a C+.

Not long ago a professor of Iowa University made the statement (over the radio) that physics is the most difficult subject in the college curriculum. We find many of the students favoring this opinion and I believe they form it from a preconceived personal prejudice rather than from investigation of any particular data or statistics.

From this first correlation I conclude that physics is not more difficult since the means of it and the average grades are exactly the same, i.e. C+. However there must be some explanation to the student's opinion, and here we may suggest the factor of individual interests. Of course different students have various interests and the difficulty of a subject depends on the intensity of the interest.

We may rather expect a considerable degree of correlation between other sciences and physics, and here again we find the high correlation of 87%, and the means are almost C+, in both cases. Since the means are practically the same in the two subjects we are led to believe that other sciences are very similar to physics in degree of difficulty.

There are a variety of opinions among the different universities